3GPP TSG-RAN WG2 Meeting #109e draft-R2-2001881

Online, February 24 – 6 March 2020

**Agenda item: 7.1.9**

**Source: Nokia, Nokia Shanghai Bell**

**Title: Standalone deployments – Discussion on remaining Issues**

**Document for: Discussion and Decision**

# 1 Introduction

The scope of this document is

* To discuss and agree on the proposals summarised in R2-2001865.
* Discuss on the open items indicated in R2-2001865

# 2 Discussion

Following are the proposals summarised in R2-2001865 related to running CR text.

**Proposal 1: RAN2 further discuss and agree on the final word for running CR text relevant for cell selection behaviour in standalone cell.**

**Proposal 2: RAN2 further discuss and conclude whether additional changes needed related to cell reselection behaviour for non BL UE from /to standalone cell.**

**Proposal 4: RAN2 further discuss on proposal 1 of [4] related to changes to be captured for TS36.304**

Following are the proposal related to enhancements to the cell reselection behaviour for standalone mode deployments.

**Proposal 3: (Potential RAN2 agreement): In standalone deployment, if a UE considers itself to be in enhanced coverage with S criteria of normal coverage fulfilled, absolute priorities for cell reselection are used (i.e. UE does not switch to ranking as it would when in enhanced coverage due to S-criteria).**

Section 2.1 contains the questions related to proposals for running CR. Section 2.2 contains the question related to the proposal for modification to cell reselection behaviour for standalone mode deployments.

## 2.1. Proposals for changes to running CR.

The CR submitted for TS36.304 [2] capturing the Rel-16 enhancements for eMTC contains the following text which contains [ ] for further confirmation.

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| If cell selection criteria S in normal coverage is fulfilled for a cell, UE [may] consider itself to be in enhanced coverage if *SystemInformationBlockType1* cannot be acquired but UE is able to acquire *MasterInformationBlock, SystemInformationBlockType1-BR* and *SystemInformationBlockType2*. |

As part of e-mail discussion on the above running CR, 3 companies supports confirmation of the word may. 2 companies proposed to change the word to shall.

**Q1. Do you agree to confirm the above text proposal by removing the [ ]. ? [This question is related to P1)**

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Huawei, HiSilicon | Yes | The only way to make this a shall is to have explicit indication that this is a standalone cell, and require it for that case only, because the case that UE is able to acquire SIB1-BR but not SIB1 may happen in the non-standalone case so we should not mandate it unless the standalone cell can be identified as such. If we use “may” then of course it is in the UE interest to camp, and this can be applied for “non-standalone” case too, so we are fine. |
| Ericsson | No | First, the TP seems to be applicable only for standalone cell case, as otherwise condition " if *SystemInformationBlockType1* cannot be acquired " would not make much sense as how would the UE know it is in normal coverage, when SIB1 couldn't be acquired. Thus we don't think the condition applies to any other than standalone cell case.  The next question is whether the UE should consider to be in enhanced coverage in the case S-criterion for normal coverage is fulfilled in a standalone cell. Remembering the following description from 36.300 23.7b:  “*A UE in enhanced coverage is a UE that requires the use of enhanced coverage functionality to access the cell.*"  the verb should be "shall", i.e. the UE needs to consider itself to be in enhanced coverage to be able to camp in the cell.  In case UE considers cell barred initially due to SIB1-BR not available, based on section 5.3.1 it is already possible for UE to select some other cell (for example where normal coverage could be offered). |
| Nokia | No | In our view, the proposal is meant to capture the UE behaviour in standalone cell case. Possibility of UE actually in normal coverage in non standalone cell but unable to decode SIB-1 is less probable. And even in this situation the downlink coverage is expected to be not good enough for normal coverage operation (.ie use of SIB1 hence the UE should consider itself in extended coverage. |
|  |  |  |

**As per the majority views expressed in the offline discussion, the verb should be changed to shall. This will reflect the UE behaviour in standalone cell which is the main scenario for the behaviour.**

**Conclusion: The verb in [] in the text proposal of running CR should be changed to “shall”**

**Text proposal: Following is the text proposal for update of running CR.**

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| --- |
| If cell selection criteria S in normal coverage is fulfilled for a cell, UE **shall** consider itself to be in enhanced coverage if *SystemInformationBlockType1* cannot be acquired but UE is able to acquire *MasterInformationBlock, SystemInformationBlockType1-BR* and *SystemInformationBlockType2*. |

In case if the UE considers itself to be in enhanced coverage when the cell selection criteria for normal coverage is satisified but unable to decode MIB,SIB-1 and SIB-2 but able to decode MIB,SIB1-BR and SIB2, the will not consider the absolute priority of inter-frequency neighbours if it follows the existing specification. As the UE actual radio condition meets the normal coverage condition in this case, it should consider these priorities. For the above issue, following is the proposal from [4].

**Proposal : In standalone deployment, if a UE considers itself to be in enhanced coverage with S criteria of normal coverage fulfilled, absolute priorities for cell reselection are used (i.e. UE does not switch to ranking as it would when in enhanced coverage due to S-criteria).**

**Q2. Do you agree to the above proposal ?**

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Huawei, HiSilicon | Yes | The reason for a UE in EC to use ranking is to ensure to be always in the cell with the best radio conditions, which can reduce the overall number of repetitions needed to receive paging, SI. If the UE is actually in normal coverage, the service-based absolute priorities should be used. |
| Ericsson | Yes | Assuming condition "if a UE considers itself to be in enhanced coverage with S criteria of normal coverage fulfilled" means the UE knows it is in standalone cell and apply absolute priorities. |
| Nokia | Yes | Agree with Huawei |
|  |  |  |

**Conclusion: Proposal 2 from [4] for inclusion of additional clarification for considering the priority of inter-frequency cell for standalone mode cell is agreed.**

**Text proposal: The highlighted part is the proposed changes for TS36.304 running CR**

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| --- |
| 5.2.4.6a Reselection for enhanced coverage  Ranking as defined in sub-clause 5.2.4.6 is applied for intra-frequency and inter-frequency cell reselection (irrespective of configured frequency priorities, if any) while the UE is in enhanced coverage.  If a UE considers itself to be in enhanced coverage with S criteria of normal coverage fulfilled, ranking as defined in sub-clause 5.2.4.6 is applied for intra-frequency and inter-frequency cell reselection considering the configured frequency priorities) |

Another proposal from [4] is to clarify the existing text for cell selection for normal coverage and enhanced coverage to be changed to replace the word “considered to be “ to “is. This change is to differentiate case where UE is considered to be in “enhanced coveage” which was included in the running CR. This proposal is the detailed version of P4 in the summary proposal.

**Proposal : Following two exact concepts are captured at least in TS 36.304:**

1. **In enhanced coverage: where S criteria of normal coverage is not fulfilled and S criteria of enhanced coverage is fulfilled;**
2. **Consider to be in enhanced coverage: where S criteria of normal coverage is fulfilled and *SystemInformationBlockType1* cannot be acquired but UE is able to acquire *MasterInformationBlock*, *SystemInformationBlockType1-BR* and *SystemInformationBlockType2*.**

**would when in enhanced coverage due to S-criteria).**

**Q3. Do you agree to the above changes given in the proposal ? (Ref Text proposal for section 5.2.3.2 in [4])**

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Huawei, HiSilicon | Yes | It is needed to distinguish between truly in enhanced coverage and considered in enhanced coverage, because the behaviour is slightly different if the UE which is only considered to be in enhanced coverage uses the normal coverage reselection rules. |
| Ericsson | FFS | Initially no, we don't think we should touch the existing conditions/definitions but we are open to discuss this more also considering the final wording (cf. above) has not been agreed yet. |
| Nokia | No | The changes to existing specification is not required in our view. Without these changes also the proposed changes of Q2 will hold good. |
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Conclusion: P1-2 of [4] Is not agreed.

Text proposal: Not Applicable.

## 2.2 Further Discussion on open Items.

When non-BL UE camped onto standalone cell, for cell reselection it is prefered to selected normal cell than standalone cell for better performance. It is also applicable for the case when UE is reselecting from normal coverage to standalone cell. The problem is analysed in [3]. Following are the proposal from [3] for introduction of new parameter to be considered in cell reselection from/to standalone cell.

Proposal : A new offset is introduced in the calculation of the neighbour cell rank when the UE is in a standalone cell and could camp in the neighbour non-standalone cell in normal coverage or vice-versa

The document also proposes text proposal to capture the above changes in TS 36.304.

Below question is related to P2 in the summary of proposal for discussion on cell reselection enhancement for standalone deployments.

**Q4. Do you agree to the above Proposal ? If yes, please indicate whether the text proposal can be considered for TS36.304 or further changes needed.**

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Huawei, HiSilicon | no | We don’t see any need for this, existing offsets can be used and reselection should be based on radio conditions. |
| Ericsson | FFS | This would depend on the outcome of earlier discussion, e.g. Q2, as there should be some mechanism. If the proposal in Q2 is not agreed, then yes we think this would be needed |
| Nokia | No | This can be realised with proper setting of cell reselection offsets in serving standalone cell and in the relevant neighbour cell parameters. |
|  |  |  |

**Conclusion: P1 from [3] is not agreed.**

# 3 Summary

In total 4 Questions were included in the offline discussion. Only 3 companies provided the inputs. The decision is based on the majority views expressed by companies for each of the questions.

We propose the following agreements based on the input received for the offline discussion.

* **The verb in [] in the text proposal of running CR should be changed to “shall”**
* **In standalone deployment, if a UE considers itself to be in enhanced coverage with S criteria of normal coverage fulfilled, absolute priorities for cell reselection are used (i.e. UE does not switch to ranking as it would when in enhanced coverage due to S-criteria).**
* **P1 from [3] and P1 from [4] are not agreed.**

# 3 References

[1] R2-1916424 RAN2-Agreements for Rel-16 additional enhancements for NB-IoT and eMTC

[2] R2-2000558 E-mail discussion summary related to cell selection for non BL UE -Nokia, Nokia Shangai Bells. RAN2-109e

[3] R2-2000980 Cell Reselection improvement for LTE-M Standalone cells. Ericsson, RAN2-109e.

[4] R2-2001070 Remaining issue on standalone deployment, Huawei, HiSilicon, RAN2-109e

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